CLAIMS

We claim:

1. A method of screening for an agent that can induce the maturation of an immature macrophage or an immature dendritic cell into a mature macrophage or a mature dendritic cell, comprising:

contacting an immature macrophage or an immature dendritic cell expressing a DDR1 with the agent; and

determining if the agent specifically binds the DDR1,

wherein specific binding of the agent to the DDR1 indicates that the agent can induce the maturation of the immature macrophage or the immature dendritic cell into a mature macrophage or a mature dendritic cell, respectively.

2. The method of claim 1, wherein the agent comprises an antibody, a chemical compound, or a small molecule.

3. The method of claim 2, wherein the agent comprises an antibody.

4. The method of claim 1, wherein the DDR1 comprises DDR1a.

5. The method of claim 1, wherein the DDR1 comprises DDR1b.

6. The method of claim 1, further comprising comparing the binding of the agent with the DDR1 to a control.

7. The method of claim 1, further comprising

measuring activation of p38 MAP kinase or Shc in the cell contacted with the agent.

8. The method of claim 1, further comprising,

measuring the expression of a cytokine or a chemokine by the macrophage or the dendritic cell.

9. The method of claim 8, wherein the cytokine or chemokine comprises interleukin-6, interleukin-8, interleukin-10, interleukin-12, macrophage inflammatory protein-1α, interleukin-1β, tumor necrosis factor-α, or monocyte chemoattractant protein-1.

10. The method of claim 3, wherein the antibody comprises a monoclonal antibody.

11. A method of inducing maturation of an immature macrophage or an immature dendritic cell that expresses DDR1, comprising:

contacting the immature macrophage or the immature dendritic cell with an effective amount of a DDR1-activating agent, thereby inducing maturation of the immature macrophage or the immature dendritic cell that expresses DDR1.

12. The method of claim 11, further comprising contacting the immature macrophage or the immature dendritic cell that expresses DDR1, or a precursor thereof, with an agent that induces the expression of DDR1.

13. The method of claim 12, wherein the agent that induces DDR1 expression comprises granulocyte-macrophage-colony stimulating factor, tumor necrosis factor-α, interleukin-1β, lipopolysaccharide, phytohemagglutinin, fetal calf serum or a combination thereof.

14. The method of claim 13, wherein contacting the immature dendritic cell or the immature macrophage with an agent that induces expression of DDR1 comprises transfecting a monocyte or a dendritic cell precursor with a nucleic acid encoding DDR1b operably linked to a promoter.

15. The method of claim 14, wherein the promoter comprises an inducible promoter.

16. The method of claim 14, wherein the promoter comprises a constitutive promoter.

17. The method of claim 11, wherein the DDR1b-activating agent comprises a DDR1-activating antibody that specifically binds DDR1.

18. The method of claim 17, wherein the antibody comprises a monoclonal antibody.

19. The method of claim 11, further comprising contacting the immature macrophage or the immature dendritic cell with an additional agent that enhances macrophage or dendritic cell maturation.

20. The method of claim 19, wherein the additional agent that enhances monocyte or dendritic cell maturation comprises tumor necrosis factor-α, interleukin-4, lipopolysaccharide, granulocyte-macrophage-colony stimulting factor, CD40 ligand, or phorbol 12-myristate 13-acetate, or a combination thereof.

21. The method of claim 11, wherein the immature macrophage or the immature dendritic cell is *in vivo*.

22. The method of claim 11, wherein the immature dendritic cell or the immature macrophage is *in vitro*.

23. A method for producing an antigen presenting macrophage or dendritic cell, comprising

contacting an immature monocyte or an immature dendritic cell with an agent that activates DDR1 in the presence of an antigen,

thereby producing an antigen presenting mature dendritic cell or an antigen presenting macrophage.

24. The method of claim 15, wherein the antigen comprises a protein, a polypeptide, a polysaccharide, a DNA molecule, a RNA molecule, a whole cell lysate, an apoptotic cell, or any combination thereof.

25. The method of claim 23, wherein the antigen is a viral, bacterial or fungal antigen.

26. A method of modifying expression of a cytokine or a chemokine in a subject, comprising:

administering to the subject a therapeutically effective amount of an agent that specifically binds DDR1b, thereby modifying the expression of the cytokine or the chemokine in the subject.

27. The method of claim 26, wherein administering the agent inhibits or enhances the activation of p38 MAP kinase or Shc.

28. The method of claim 26, wherein the subject has a chronic inflammatory disease.

29. The method of claim 26, wherein the subject has a tumor.

30. The method of claim 26, wherein the cytokine or chemokine comprises interleukin-8, interleukin-10, interleukin-12, macrophage inflammatory protein-1α, interleukin-1β, tumor necrosis factor-α, or monocyte chemoattractant protein-1.

31. A method of activating a neutrophil or a lymphocyte, comprising

activating a DDR1 signalling pathway in the neutrophil or a lymphocyte, thereby activating the neutrophil or the lymphocyte.

32. The method of claim 31, wherein activating the neutrophil or lymphocyte comprises inducing cytokine secretion by the neutrophil or the lymphocyte.

33. The method of claim 31, wherein activating the neutrophil or the lymphocyte comprises increasing neutrophil or lymphocyte migration.

37. The method of claim 31, wherein the neutrohil or lymphocyte is *in vivo*.

38. The method of claim 34, wherein the neutrophil or lymphocyte is *in vitro*.

39. A method of altering leukocyte migration, comprising contacting a leukocyte with an antibody that specifically binds DDR1a, thereby altering leukocyte migration.

40. The method of claim 39, wherein the antibody comprises a monoclonal antibody.

41. The method of claim 39, wherein leukocyte migration is decreased.

42. The method of claim 39, wherein the leukocyte is *in vivo*.

43. The method of claim 39, wherein the leukocyte is *in vitro*.

44. The methyod of claim 39, wherein the leukocyte is a lymphocyte.

45. The methyod of claim 39, wherein the leukocyte is a neutrophil.